

NAME: \_\_\_\_\_

## UNIT 3 • LINEAR AND EXPONENTIAL FUNCTIONS

### Lesson 6: Building Functions

#### Practice 3.6.1: Building Functions from Context

Write an explicit equation to represent each pattern below.

1. Mr. Ramos notices a pattern in the number of people attending the weekly student government meetings. For weeks 1, 2, 3, 4, and 5, the number of students attending the meeting was 31, 43, 55, 67, and 79, respectively.
2. Hannah borrows \$30 from her parents. Each week, she pays them back the same amount. The total amounts she owes her parents after weeks 0, 1, 2, 3, and 4 are \$30, \$25, \$20, \$15, and \$10, respectively.
3. Angelo sells cookies in packages, where each package contains the same number of cookies. The total amounts of cookies he has after 1, 2, 3, 4, and 5 packages are sold are 110, 88, 66, 44, and 22, respectively.
4. Cameron tracks the growth of leaves on a tree in his yard. Each week, he notes the number of open leaves on the tree. In weeks 1, 2, 3, 4, and 5, the tree has 12, 60, 300, 1,500, and 7,500 leaves, respectively.
5. As a treat, Nia eats a portion of a chocolate bar each day. She eats the same portion of the remaining bar each day. On day 0, the bar of chocolate starts with 32 pieces. After 1 day, 16 pieces remain. After days 2, 3, and 4, there are a total of 8, 4, and 2 pieces remaining.
6. Given the diagram below, describe the number of sides in Figure  $x$ .

Figure 1

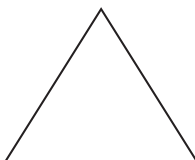


Figure 2



Figure 3

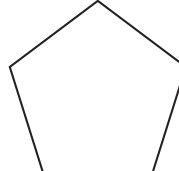
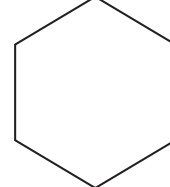


Figure 4



*continued*

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7. Given the diagram that follows, describe the number of blocks in Figure  $x$ .

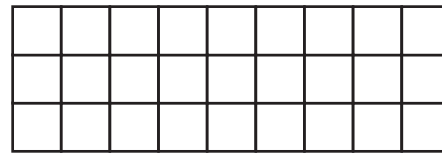
Figure 1



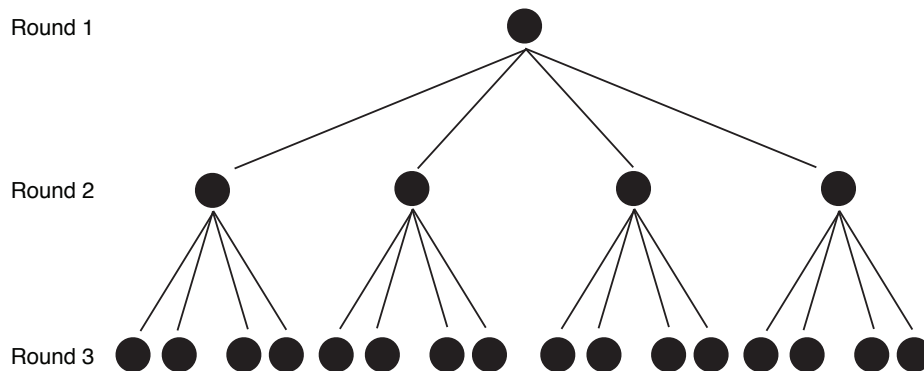
Figure 2



Figure 3



8. A rural school uses a phone tree to reach parents when the school is closed. Each parent calls multiple parents to notify them of the school closing. These parents then each call multiple parents, and so on. The diagram below shows the number of parents called after each round of calls. Each dot represents a parent. Find an explicit equation to represent the number of parents called in any round  $x$ .



9. A hotel charges a room fee per night, plus an additional fee if more than one guest is staying in a room. Good Nights hotel charges \$150 per night for a room, plus \$25 per guest if more than one guest is staying in a room. Find an explicit equation to represent the nightly cost for any number of guests.
10. The population of a city is growing. Each year, the population increases by approximately 10%, or 0.10 times the previous year's population. The population this year is 10,000. Find an explicit equation to represent the population of the town in any year. Consider that year 0 is this year.